

Effect of lifestyle (eating habits and physical activities) on Weight Gain of Rural and Urban Secondary School Adolescents in Cross River State, Nigeria

¹ Lilian. Eyam Eberechukwu, ² Eyam-S Eyam, ³ Emmanuel Nsan

¹Department of Public Health, Faculty of Allied Health science, University of Calabar, Calabar, Nigeria.

²Department of chemical Parthology, Faculty of Laboratory Medicine University of Calabar Teaching Hospital, Calabar, Nigeria

*Email lilaringus@yahoo.com

Abstract

A study on the pattern of lifestyles (physical activity and eating habit) amongst students in rural Akpabuyo local government Areas (LGA) and urban Calabar Municipality in Southern Cross River State, Nigeria, was conducted. The design of this study was a cross-sectional survey involving senior secondary school adolescents aged 12-21years. A simple random sampling was used to select four schools from 25 urban and 14 rural secondary schools in the Southern Senatorial District of Cross River State (CRS). Systematic random sampling was used to draw a sample of 480 senior secondary students from a population of 6130 senior secondary students enrolled in 39 secondary schools in rural and urban areas of the study area. The result showed that there was high prevalence of obesity amongst adolescents that took breakfast regularly out of the house.

Keywords; obese, eating habit. adolescents, physical activity,

1. Introduction

Adolescence is one of the fastest growth periods of a person's life. During this time, physical changes affect the body's nutritional needs, while changes in one's lifestyle may affect eating habits and food choices. Physical activity and diet are known to be the major lifestyle/environmental factors that are associated with obesity (WHO, 2000). In the last few decades, regular trends of obesity have coincided with changes in dietary habits and physical activity. It has been noticed that with a fall in physical activity especially from middle age to elderly, there is increased weight gain even with very little caloric intake of about 20%- 25% (Luke *et al*, 2002). Adolescents tend to eat differently than they did as children. With after-school activities and active social lives, teens are not always able to sit down for three meals a day. Busy schedules may lead to meal skipping, snacking throughout the day, and more eating away from home. Many teens skip breakfast, for example, but this meal is particularly important for getting enough energy to make it through the day, and it may even lead to better academic performance ((Duyff, 2002). Higher physical activity levels can substantially limit the risk of overweight and some persons can tolerate higher fat intake if they are particularly active (York *et al*, 2004).

High fat energy-dense diets and sedentary life styles are the characteristics most strongly associated with the increased prevalence of obesity worldwide (WHO, 2000). Thus, in a population study that paid careful attention to determinants of obesity, a positive association was observed between dietary factors and obesity and this was identical with those found in animal models (Popkins, 2002). Dietary factors and physical activity pattern are considered to strongly influence energy balance equation and that they are the major modifiable factors through which many factors, or forces promoting weight gain act (WHO, 2000). Cross sectional data often reveal an inverse relationship between body mass index (BMI) and physical activity (Davies & Christofell, 1995). This indicates that obese and overweight subjects are less active than their lean counterparts although such correlations however do not demonstrate cause and effect relationship. It is therefore difficult to be certain whether the low level of inactivity is caused by the obesity (WHO, 2000). Results from other studies however suggested that low levels of physical activity are primarily responsible for the instance obesity that is absent among elite-athletes, while those athletes who give up sports frequently experience an increase in body weight (Williamson, 1994). Moreover, the secular trend in the increased prevalence of obesity seems to parallel a reduction in physical activity and a rise in sedentary behavior (James, 1995). This study is therefore aimed at determining the pattern of lifestyle i.e. eating habit and physical activity of students in rural and urban areas in Cross river state Calabar.

2. Methodology

This study targeted the secondary school students in Calabar Municipality and Akpabuyo LGA. The estimated population for secondary school students in Calabar Municipality was 9804, of which 4,804 were in classes 1 to 3 (i.e. SS1 to SS3). In Akpabuyo, the population of secondary school students was 3,678 of which 1226 SS1 to SS3s. Multistage sampling technique was used. The schools were stratified into rural and urban according to

their locations. Samples were drawn from the urban and rural schools separately by simple balloting. Four schools were selected from the urban and four from the rural setting. An arm was selected from each class from SS1-SS3 using simple random balloting. Twenty students were selected from each selected arm. This was done through systematic sampling. The sampling frame was class register. Each class had a different nth number because each class had its own register and these represented the sampling frame. This was divided by the sample size to get the sample interval (nth number). The class registers for SS1 –SS3 were used and every nth student was selected from the register until sixty students were selected in each school. In a case where the student was absent or does not give consent the next student in the register was selected.

The instrument for data collection used was a Semi- structured questionnaire comprising four sections (Demographic data, anthropometric data, life style and family history) was used to get information from the subjects. A bathroom scale calibrated from zero to 120Kg was used to measure the weight of the subjects. The scale was checked, corrected for zero error and pre-tested before every measurement. Each subject was allowed to wear only the school uniform for measurement; all shoes and sweaters was removed. The weight was read to the nearest 0.5 Kg.

The data were analyzed using Epi- info 2002 6.1 version and chi-square was used to test the hypothesis. The eating habits and physical activities of boys were compared with those of the girls, and the eating habits and physical activities of rural secondary students were compared with those of urban secondary students. The result was summarised and presented in tables.

3. Results

The lifestyle of secondary students in Calabar municipality and Akpabuyo LGA. Include their physical activity and eating habit. Eating habits are the eating pattern and type of food eaten from morning to night while physical activity is activities before school hours, during school and after school hours. Table 6 shows the lifestyle (eating habit and physical activity) of underweight students in rural and urban areas of the Southern Senatorial District. All the underweight students took breakfast every morning and 63.6% did specific sporting activity (40.9% in the urban and 22.7% in the rural areas). The difference in the proportion of underweight students who engaged in sporting activities was statistically significant in the urban area compared with those in the rural area ($p=0.04$). The lifestyle of normal weight students in rural and urban areas of Southern Senatorial District, CRS are shown in Table 7. About 50% and 27.4% of the normal weight students from the rural and urban areas respectively, took breakfast every morning. Table 8 shows the lifestyle (eating habits and physical activity) of overweight students in rural and urban areas. In the rural and urban areas, 9.7% and 19.5% of the overweight students respectively ate often at school while 10.5% in the urban and 23% in the rural areas never ate at school. About 38% of the overweight students in the rural area did sports once a week while 8.2% did sports every day. In the urban area 38% of the overweight students did sports at least once a week and 3.9% did sports every day

TABLE 1

Life style (eating habit and physical activities) of underweight students in rural and urban areas of Southern Senatorial District, CRS (n=22)

Eating habit for the underweight

BMI<18(eating habits)	Rural	Urban	Total
Meals/day			
>Thrice	0	27.3%	27.3%
Thrice	22.7%	45.5%	60.2%
Breakfast			
Yes	22.7%	60.2%	90.2%
No	4.5%	4.5%	9%
Eating in school			
Never	9.1%	4.5%	13.6%
Often	0	4.5%	4.5%
rarely	13.6%	36.4%	50%
Food Type			
Snacks	13.6%	36.4%	50%
Cooked	0	9.1%	9.1%
fruits	0	18.2%	18.2%

Table 2

Physical activities for underweight subjects

Activities at home			
Households	13.6%	54.5%	60.2%
Outdoors	4.5%	27.3%	31.8%
Sports /week			
Everyday	13.6%	9.1%	22.7%
Twice	0	0	0
Once	4.5%	59.1%	63.6%
Never	4.5%	9.1%	13.6%

TABLE 3

Life style (eating habit and physical activities) of normal weight students in rural and urban areas of Southern Senatorial District, CRS (n=117).

Eating Habit for normal weight students

BMI>18<20	Rural	Urban	Total
Eating habit			
Meal/day			
>thrice	2.6%	4.3%	6.8%
Thrice	44.4%	29.9%	73.4%
Twice	16.2%	2.6%	17.9%
Break fast			
Yes	50.4%	27.4%	77.8%
No	12.8%	9.4%	22.2%
Eating in school			
Never	30.8%	4.3%	35%
Often	7.7%	16.2%	9.4%
Rarely	24.8	16.2%	41.0%
Food type			
Snacks	29.9%	18.8%	48.7%
Cooked food	1.7%	7.7%	9.4%
Fruits	1.7%	5.9%	7.7%
Others	0	0.85%	0.85%

Table 4

Physical activity for normal weight subjects

Activities at home			
Households	51.3%	29.9%	81.2%
outdoors	11.1%	5.9%	17.1%
Sports/week			
Everyday	11.1%	7.7%	18.8%
Twice	0	0	0
Once	40.2%	26.2%	66.7%
Never	9.4%	5.9%	15.4%

TABLE 5

Activities at home			
Indoors	98(38.1)	95(37)	193(75.1)
Outdoors	28(10.9)	36(14)	64(24.9)
Sports/week			
Everyday	21(8.2)	10(3.9)	31(12.1)
Twice	0	0	0
Once	97(37.7)	90(35.1)	187(72.8)
Never	8(3.1)	31(12.1)	39(15.2)

Life style (eating habit and physical activities) of overweight (BMI>20<24) students in rural and urban areas of Southern Senatorial District of CRS (n=257)

Table 6
 Physical Activities for overweight subjects

BMI>20<24	Rural	Urban	Total
Eating habit			
Meal/day			
>thrice	10(3.9%)	40(15.5%)	50(19.4)
Thrice	76(29.6)	75(29.2)	151(58.8)
Twice	40(15.5)	15(5.8)	55(21.4)
once	0	1(0.4)	1(0.4)
Breakfast			
Yes	112(43.6)	118(45.9)	230(89)
No	14(5.4)	13(5.1)	27(10.5)
Eating in school			
Never	59(23)	27(10.5)	86(33.5)
Often	25(9.7)	50(19.5)	75(29.2)
Rarely	41(16)	53(20.6)	94(36.6)
Food type			
Snacks	35(13.6)	22(8.6)	57(33.5)
Cooked food	2(0.8)	9(3.5)	11(4.3)
Fruits	2(0.8)	7(2.7)	9(3.5)
others	0	1(0.4)	1(0.4)

The difference in the proportion of overweight students who engaged in sporting activities was statistically significant in the urban compared to those in the rural areas (p=0.0001)

TABLE 7

Life style (eating habits and physical activities) of obese (BMI>24) students in rural and urban areas of Southern Senatorial District, CRS (n=24)

BMI>24	Rural (%)	Urban	Total
Eating Habit			
Meals/day			
>thrice	1(1.2)	7.1	8.3
<thrice	33.3	33.3	66.6
Twice	7.1	15.5	21.4
Breakfast			
Yes	4.8	13.1	17.9
No	35.7	45.2	81
Eating in school			
Never	14.3	4.8	19
Often	7.1	19	26.2
Rarely	20.2	34.5	54.8
Type in food			
Snacks	20.2	32.1	52.3
Cooked food	4.8	4.8	9.5
Fruits	3.6	14.3	17.9

Table 8

Physical activities of obese secondary school adolescents in Cross River State, Nigeria

Activities at home			
Households	3.6	2.4	6.0
Outdoors	1.2	7.1	8.3
Sports/week			
Everyday	0	0	0
Twice	3.6	2.4	6.0
Once	1.2	15.5	16.7
Never	1.2	2.4	3.6

Lifestyle (eating habits and physical activity) of obese students in rural and urban areas of Southern Senatorial District, CRS are shown in Table 9. In the rural and urban areas respectively, 4.8% and 13.1% of the obese students took breakfast every morning. Nineteen percent and 7.1% of the obese students in the urban and rural areas respectively, ate often in school. The difference in the proportion of obese students with different eating patterns in the urban area compared to those in the rural areas was not statistically significant ($p=0.17$). About 16% and 1.2% of the obese students in the urban and rural areas respectively did sports at least once a week. In the urban and rural areas respectively, 14% and 3.6% did indoor chores at least once a week and 7.1% and 1.2% did outdoor chores at least once a week. The difference in proportion of obese students who engage in sporting activities in the rural area compared to those in the urban area was statistically significant ($p=0.01$)

4. Discussion

In this study all the obese took breakfast regularly. This is contrary to the study that observed that skipping breakfast was associated with high risk of obesity (Yunsherg *et al*, 2003). This agrees with the fact that bad eating patterns are associated with obesity even after controlling the total energy intake and physical activity (Bellisle, McDevitt & Prentice, 1997). The high prevalence of obesity with taking breakfast among the students could be because of increased proportion of breakfast and eating breakfast out of home which is also associated with high risk of obesity. It is possible that these students take breakfast out of home most of the time because of the fear of going late to school. So this might be one of the major aspects of weight gain amongst these adolescents. The weight gain could also be due to the consumption of large quantities of snacks while watching television and during school hours (Kosti, Panagiotakos and ZBampelas 2008). All over the world, adolescent obesity is on the rise and this has led to an increase in obesity-related diseases like diabetes and heart disease (Cavalcanti, Barros and Meneses *et al*, 2010). Dietary decisions made in adolescence may have lasting health effects (Duyff, 2002). Most non-communicable diseases especially obesity that are a burden to our public health spring from unhealthy lifestyle that goes on unnoticed but accumulates fat and cholesterol that turns to

predispose us to non-communicable diseases. The eating habit and physical activity that should have started way back at secondary school days may go a long way to affect individual during adulthood (Dyfur, 2002). This may lead to complicated non-communicable diseases such as diabetes, hypertension, cancer etc that may portend to early death. Experts believe this rise in obesity is due to lack of physical activity and an increase in the amount of fast food and "junk food" available to adolescents (Cavalcanti, Barros and Meneses et al, 2010). Staying active and eating foods that are low in fat and sugar promote a healthy weight for teens (WHO, 2002).

References

- Cavalcanti CB, Barros MV, Meneses AL, Santos CM, Azevedo AM, Guimarães FJ (2010). Abdominal obesity in adolescents: prevalence and association with physical activity and eating habits. <http://www.ncbi.nlm.nih.gov/pubmed/20730265#>
- Duyff, Roberta Larson (2002). *American Dietetic Association Complete Food and Nutrition Guide*. New York: Wiley.
- Kosti RI, Panagiotakos DB, Zampelas A, Mihos C, Alevizos A, Leonard C, Tountas Y, Mariolis A. (2008) The association between consumption of breakfast cereals and BMI in schoolchildren aged 12-17 years: the VYRONAS study. *Public Health Nutr* (10)1015-2
- Flatt J. (1988): Importance of nutrient balance in body weight regulation. *Diabetes Metabolism & Review*, 4, 571-581.
- Food and Agricultural Organization of the United Nations (2001): Food insecurity when people live with hunger and fear starvation; the state of food insecurity in the world. Rome Italy: Food and Agriculture Organization of the United Nations, 2(3), 26-29
- Goran, M. (1995): Variation in total energy expenditure in humans. *Obesity Research*, 3, 59-66
- Keim N.L, Van Loan M.D & Horn W.F (1997): Weight loss is greater with consumption large morning meals with fat-free mass is preserved with large evening meals women on a controlled weight reduction regimen. *Journal of Nutrition*, 127, 75-82.
- Lin B.H, Guthrie J & Frazao E (2001): Away from home foods increasingly important to quality of America, diet. Washington, DC: Economic Research Service, US Department of Agriculture. (http://www.ers.usda.gov/publication/aib/749/aib_749.pdf retrieved May, 2001
- Luke A, Durzo-Arviso R.A, Rotimi C.N, Lams H, Scheoller D.A, Adeyemo A.A, Forrester T.E, Wilks R & Cooper R.S (2002): Activity energy expenditure and adiposity among black adults in Nigeria and United States. *American Journal of clinical Nutrition*, 75 (6), 1045-1050.
- McCrorry M, Fuss P & Hays N (1999): Overeating in America: Association between restaurant food consumption and body fatness in health adult men and women ages 19-80. *Obesity Research*, 7, 564-571.
- Popkin B.M (2002): Shift in stages of the nutrition transition in the developing world differs from past experiences. *Public Health Nutrition*, 3, 45-49
- Stanton J.L & Keast D.R (1989): Serum cholesterol fat intake and breakfast consumption in the United States adult population. *Journal American Colloquium Nutrition*. 8, 567-572
- West D.B (1992): Dietary obesity in nine inbred mouse strains. *American Journal of Physiology*, 262, 1026-1032.
- Woods S, Seeley R, & Porte D, (1998): Signals that regulates food intake and energy homeostasis. *Science*, 280, 1378-1383.
- World Health Organization (2000): Obesity preventing and managing the global epidemics World Health Organization *Technical Report support series* 894. Geneva: World Health Organization
- World Health Organization (2002): The world health report 2002, Reducing risks, promoting healthy life. Geneva: World Health Organization
- Wren A, Seal L & Cohen M, (2001): Ghrelin enhances appetites and increase food intake in humans. *Journal Clinical Endocrinology and Metabolism*, 86, 59-92.
- Yunsheng M, Bertone ER, Stanek EJ, Reed G.W, Herbert J.R, Cohen N.L, & Ockene I.S,(2003): Association between eating patterns and obesity in a free-living US adult population. *American Journal Clinical Nutrition*, 571, 205-211
- Yao M. & Roberts S.B, (2001): Dietary energy density and weight regulation. *Nutrition Reviews*, 59, 129-139
- Ye Guang-Jun (1995) The nutrient intakes of Chinese children and adolescents and their impact on growth and development. *Asia Pacific Journal Nutrition and Supplements*, 1, 12-14
- York D.A, Stephen R, Ian C, Chen CM, James WPT, Shiriki K Reynaldo M & Vorster (2004) Obesity a world epidemic related to heart and stroke. *Circulation*, 110, 463-470

This academic article was published by The International Institute for Science, Technology and Education (IISTE). The IISTE is a pioneer in the Open Access Publishing service based in the U.S. and Europe. The aim of the institute is Accelerating Global Knowledge Sharing.

More information about the publisher can be found in the IISTE's homepage:

<http://www.iiste.org>

CALL FOR PAPERS

The IISTE is currently hosting more than 30 peer-reviewed academic journals and collaborating with academic institutions around the world. There's no deadline for submission. **Prospective authors of IISTE journals can find the submission instruction on the following page:** <http://www.iiste.org/Journals/>

The IISTE editorial team promises to review and publish all the qualified submissions in a **fast** manner. All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Printed version of the journals is also available upon request of readers and authors.

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digital Library, NewJour, Google Scholar

